

# PATENT SPECIFICATION

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DRAWINGS ATTACHED.

Inventor:—ARTHUR WILLIAM MOSS.

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## COMPLETE SPECIFICATION.

### Improvements in Electric Illumination Devices.

We, H. FROST & COMPANY LIMITED, a British Company, of 34, Fieldgate, Walsall, Staffordshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to electric illumination devices of that kind having lamp means and flicker-producing means and having a viewing screen through which flickering light is viewed and in front of which is disposed imitation fuel, whereby the operation of the device results in the simulated appearance, to the viewer, of upwardly-shooting flames originating behind the said fuel in front of the screen. Devices of this kind are illustrated in our Patent Specifications Nos. 957,591, 968,568, 975,009, 978,364 and 978,365.

The object of the present invention is to provide an illumination device of this kind with means which are intended to increase the realism of the flame effect.

According to the invention, an electric illumination device, of the kind referred to, has imitation solid fuel arranged behind the screen, whereby when the device is in operation the simulated flames appear to rise from between that imitation fuel which is in front of the screen and that imitation fuel which is behind the screen. This arrangement tends to give a more realistic effect than if the simulated flames appeared to rise only from behind imitation fuel.

Figure 1 of the accompanying drawings shows, by way of example, an electric fire embodying an electric illumination device constructed in accordance with the present invention, said fire being illustrated in diagrammatic vertical section.

Figure 2 is a front view of the imitation

solid fuel of, and of the lower part of the screen of, the fire shown in Figure 1.

Figure 3 is a plan view of the imitation fuel, and the screen, of the said fire shown in Figure 1.

Referring to the drawings, an electric fire has a heating element 1 disposed in front of a radiant-heat reflector 2 and incorporates an electric illumination device comprising one or more red or orange coloured electric lamps such as 3 associated in known manner with flicker-producing means in the form of one or more rotatable spinners such as 4 which rotate under the action of hot air from the lamp means, the said lamp means and flicker-producing means being disposed beneath the bottom edge of an upwardly-extending arcuate light-diffusing screen 5, and forwards of a light reflector 6, the arrangement being such that, when the lamp means is switched on, red or orange flickering light from the combination of lamp means and flicker-producing means is reflected, by the light-reflector 6, forwards through the light-diffusing screen 5, which forms a viewing screen for the said reflected light.

Imitation solid fuel 7 is arranged in front of the lower part of the viewing screen 5 and portions of said fuel 7 extend up to the front face of the screen 5. In this embodiment the light reflector 6 has reflecting areas of upwardly-extending flame shape, this reflector being of a construction described and shown in our Patent Specification No. 968,568, and the viewing screen 5 is in the form of a panel made of a P.V.C. plastics material and having a light-diffusing surface formed thereon by abrading on the panel (for example by a mopping process) a multiplicity of closely-adjacent thin horizontal or near-horizontal broken or unbroken trans-

verse lines extending from one side of the panel to the other, the said screen being of a construction described and shown in our Patent Specification No. 957,591. The panel which is abraded to form the light-diffusing surface is, in this embodiment, transparent before the abrading operation.

In the embodiment now being described, imitation fuel 8 is arranged behind the screen 5, said fuel 8 extending up to the rear face of the screen. The opacity of the viewing screen 5 is locally reduced, at areas (such as the area indicated diagrammatically at 9) in the vicinity of the imitation fuel 8 behind the screen, by spraying such areas with clear varnish, the positions of these less-opaque areas being chosen so as to allow the best view of the said imitation fuel 8 behind the screen. (If desired, instead of spraying the screen 5, the desired less-opaque areas such as 9 may be formed, at the time the light-diffusing surface is formed on the panel, by abrading appropriate portions of the panel less heavily than the remainder thereof, so that said less-heavily abraded panel portions retain more of the initial clearness of the panel). The arrangement is such that the imitation fuel 8 behind the viewing screen 5 appears to form a rearward continuation of portions of imitation fuel 7 in front of the said screen 5, and when the lamp means is switched on there results, to a viewer viewing the fire from the front, the simulated appearance of upwardly-shooting flames originating behind the imitation fuel 7 at the front of the screen 5 but forwards of the imitation fuel 8 at the rear of the screen 5, that is simulated flames appear to rise from between the imitation fuel 7 which is in front of the screen and the imitation fuel 8 which is behind the screen.

The imitation fuel provided may be imitation coal or imitation wood logs.

In the embodiment shown, the imitation fuel 7, 8 of the device is formed by portions of two moulded one-piece shells 10, 11 (conveniently made of glass fibre reinforced plastic), one shell, shown at 10, being in front of the screen 5 and including the front imitation fuel 7, and the other shell 11 being behind the screen 5 and including the rear imitation fuel 8, and the said shells 10, 11 being illuminated from beneath by the lamp means. The front shell 10 has a rebated rear edge which, when the shells 10, 11 are in position, is opposed to the front edge of the rear shell 11 to leave between the shells an upwardly-presented arcuate slot 12 receiving the lower part of the screen 5. (If desired provision for the slot may be made by rebating the front edge of the rear shell 11 instead of, or in addition to, rebating the rear edge of the front shell 10.)

The positions of the imitation fuel and

the lamp means in the above-described embodiment are arranged to be such that appreciable shadows are not thrown by the imitation fuel on the screen 5 or on the light reflector 6. Arrangement of the lamp means with a view to reducing to a minimum the casting of shadows by the imitation fuel may be facilitated by using a plurality of lamp bulbs, rather than only a single bulb, as the lamp means, and by positioning such bulbs substantially beneath plain portions of the shell 11. However, small dense shadows may in some instances improve the simulated fuel effect by giving the impression that they are lumps of fuel, or shadows cast by fuel illuminated by flames.

Instead of being of the simple arcuate cross-sectional form shown, the screen 5 may be a corrugated form in horizontal cross-section, similarly to the screen shown in Figure 2 of our hereinbefore-mentioned specification No. 957,591, and the slot 12 may be shaped to correspond to such corrugated curvature.

If required, instead of the imitation fuel 7, 8 being portions of two separate one-piece shells 10, 11, the imitation fuel may be formed by portions of a single one-piece moulded shell, part of such single shell being disposed in front of, and part behind, the viewing screen, and said shell having formed therein a slot, for example a slot formed by a saw-cut, receiving a lower part of the screen.

If desired, the imitation fuel at the rear of the screen may be formed by, or by one or more portions of, a moulded one-piece shell arranged to be secured by adhesive to the rear face of the lower part of the screen; or, said fuel at the rear of the screen may be formed by a plurality of separate moulded pieces each simulating a piece of fuel and individually secured by adhesive to the said rear face of the lower part of the screen.

#### WHAT WE CLAIM IS:—

1. An electric illumination device, of the kind referred to, having imitation solid fuel arranged behind the viewing screen, whereby when the device is in operation the simulated flames appear to rise from between that imitation fuel which is in front of the screen and that imitation fuel which is behind the screen.

2. An electric illumination device, as claimed in claim 1, wherein the imitation fuel of the device is formed by portions of two moulded one-piece shells, one shell being in front of the screen and the other behind the screen, and one of said shells having a rebated edge which, when the shells are in position, is opposed to an edge of the other shell to leave between the shells an upwardly-presented slot receiving a lower part of the screen.

3. An electric illumination device, as claimed in claim 1, wherein the imitation fuel of the device is formed by upwardly-projecting portions of a single one-piece moulded shell, part of this shell being disposed in front of, and part behind, the screen, and said shell having therein a slot receiving a lower part of the screen. 20
- 5 4. An electric illumination device, as claimed in claim 1, wherein the imitation fuel at the rear of the screen is formed by, or by one or more portions of, a moulded one-piece shell secured to the rear face of a lower part of the screen.
- 10 5. An electric illumination device, as claimed in claim 1, wherein the imitation fuel at the rear of the screen is formed by separate moulded pieces each simulating a piece of fuel, said pieces being individually secured to the rear face of a lower part of the screen. 20
6. An electric fire incorporating an electric illumination device constructed in accordance with claim 1
7. An electric fire, substantially as herein described with reference to the accompanying drawing. 25

H. N. & W. S. SKERRETT,  
24, Temple Row, Birmingham, 2,  
Agents for Applicants.

